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Report of the Joint Special Recess Committee...

Boston

1917

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# REPORT

OF THE

## JOINT SPECIAL RECESS COMMITTEE

ON

## BUILDING LEGISLATION

RELATIVE TO

# FIRE PROTECTION IN SCHOOLHOUSES.

JANUARY, 1917.

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# REPORT OF THE JOINT SPECIAL COMMITTEE ON BUILDING LEGISLATION RELATIVE TO FIRE PROTECTION IN SCHOOLHOUSES.

*To the Honorable Senate and the House of Representatives.*

This matter came before the General Court as a result of the fire on Oct. 26, 1915, at St. John's Parochial School, Peabody. The loss of life in this fire caused widespread agitation for better fire protection, which resulted in a conference held in Faneuil Hall on Nov. 9, 1915, in which the subject was discussed and a committee appointed for investigation. The report of that committee is annexed to this report as Appendix A, as a valuable and suggestive treatment of the general principles of fire protection. Under the auspices of the committee was drafted also House Bill No. 1715 of the session of 1916, which is the basis of this investigation.

House Bill No. 1715 of 1916 and an amended draft thereof are annexed hereto as Appendices B and C.

This bill met with vigorous opposition from the various cities and towns of this Commonwealth, as well as from a number of private schools. The contentions of the opponents were mainly that the bill would entail an enormous expense, to be met within a limited time; that its provisions were in part needless and for the purpose of affording protection for school children useless; and that in some cases the provisions could not be carried out.

That these objections may appear in more detail, the committee subjoins its analysis of the bill and a statement of the objections in detail.

## Analysis of House Bill No. 1715.

*Section 1. Definition of "Schoolhouse."* — The original draft followed the definition in chapter 655 of the Acts of the year 1913; *i.e.*, a building or part thereof in which public or private instruction is afforded to ten or more pupils at one time. The amended draft confined the scope of the act to buildings used wholly or mainly as schools, admitting pupils of primary,

grammar or high school grades or their equivalent. This change was made apparently to avoid opposition of colleges and other private institutions. It would operate to exclude rooms in private buildings rented for school purposes.

In order to avoid confusion, statutory definitions of the same word should not be multiplied. Therefore the first definition should be adhered to.

*Section 2. Time for Compliance.* — This was fixed originally at Jan. 1, 1917, with provision for an extension in case of necessity. This is a more generous allowance than that in chapter 655 of the Acts of 1913, which is merely thirty days. There is a certain degree of reason in allowing more time to cities and towns for making extensive alterations, inasmuch as their powers of raising money by loan can seldom be exercised without a certain unavoidable delay, and their power to raise money by taxation must be exercised at a certain time of the year. Repairs of an important nature must, as a rule, be done in the summer months when the schoolhouses are unoccupied. The thirty-day rule is therefore nearly impossible to comply with, and most cities as a matter of fact do not comply with it. A power to extend the time might well, therefore, be lodged with the chief of the District Police.

The amended draft, however, struck out this provision and vested the powers of a board of appeal in the judge of the local Probate Court, authorizing him, practically, to suspend the requirements of the act. This introduces a degree of flexibility into the act which is very desirable, but the policy of vesting the Probate Court with this function may be questioned. Our judges of probate in the larger counties are already heavily burdened, and are not, moreover, qualified to discharge a function which demands some experience in the technique of building and of fire prevention.

The amended draft is entirely right in pointing out the need of flexibility. Our schoolhouses present so wide a variety of construction that strict rules of law will inevitably work unnecessary hardship if rigidly applied. Either discretion must be given the inspectors, or some power to modify the requirements of the act should be given; for in many cases the problem must be worked out for each building by itself.



*Section 3. Requirements for One-story Schoolhouses, where the Heating Apparatus is located in the Basement.* — The requirements are as follows: —

(1) Basement ceiling, if of combustible material, to be covered with metal lath and cement plaster.

(2) Spaces under walls and partitions, over girders, around heat and vent pipes, and around stairways, to be fire-stopped with brick in mortar, or its equivalent.

(3) Self-closing fire doors to be installed at top or bottom of each stairway.

Portable schoolhouses are exempted, although this exemption is probably unnecessary.

These requirements are intended to accomplish the isolation of the basement from the rest of the building and the protection of the lower floor. As most fires occur in the basement, this avoids most of the risk, because if flames and smoke can be confined for even a short time, the building can be emptied of its occupants with slight danger of panic.

Fire-stopping ought to be carefully attended to in all cases. The district police claim that they have no power to order existing buildings to be fire-stopped.

Metal lath and cement plaster serve a useful purpose, especially over heating apparatus and compartments containing combustible material. Elsewhere the use may be criticized unless the fire-stopping is thoroughly attended to, inasmuch as if fire gets into the enclosed spaces which are left where it is laid over joists, it is difficult to detect, difficult to extinguish, and may travel extraordinary distances over the building.

The District Police are requiring the ceiling, unless of fireproof or mill construction, to be covered with metal lath and cement plaster.

Fire doors serve a useful purpose. They cannot, however, be installed in all cases without extensive structural alterations. At the head of stairs a door of wire glass in metal frame is preferable, inasmuch as a fire door would often make the stairway dark, producing conditions more likely to result in accident than the somewhat remote risk of fire.

The question may be raised as to the whole section whether one-story schoolhouses need fire protection. The risk is rela-

tively small, the number of scholars accommodated in such structures is not great, and access to the outside is readily gained in case of necessity through the windows. The Fire Prevention Commissioner expressed an opinion that the whole section might be omitted without impairing the value of the act.

*Section 4. Requirements for Schoolhouses over One Story in Height.* — These requirements are as follows: —

(1) Metal lath and cement plaster covering ceiling of basement, underside of stairways, and of landing leading into basement if not of fireproof construction.

(2) Fire-stopping as in preceding section.

(3) Fire doors as in preceding section.

These requirements apply whether the heating apparatus is located in the basement or not.

*Section 5. Automatic Sprinklers.* — In all schoolhouses of over one story these are to be installed in the entire basement, and in all rooms above the basement used for manual training, laboratories, or other hazardous purposes. Buildings where the first floor is not connected by stairways with the basement are exempted.

In the amended draft all schoolhouses of fireproof construction are exempted, and provision is made that where sprinklers are installed self-closing doors on basement stairs need not be fire doors.

This section has aroused more opposition than any one part of the bill. The expense of installing automatic sprinklers is large. Figures are usually quoted on a "per head" basis, which means nothing unless the size of the building and the cost of connecting with a suitable water supply are given. The city of Somerville has installed sprinkler systems in four schoolhouses at a cost of $7,600, exclusive of the expense of connecting with the city water service, which will cost about $1,800 additional. This cost in many localities would be much greater, for all schoolhouses are not situated in proximity to a water supply under sufficient pressure. Under such circumstances a tank on trestles and pumping machinery would have to be installed, making the cost prohibitive.

In most cases automatic sprinklers are of more value in conserving the property than in saving life. The case of a schoolhouse is radically different from that of factories containing large quantities of inflammable substances. If the smoke and flame can be confined to the basement for a relatively short time, the pupils can be conducted out of the building safely; and it would seem that with the other requirements of the act in force, a reasonable degree of care in removing rubbish and guarding combustible supplies and materials, sufficient precautions for safety will have been taken.



There may be circumstances of exceptional hazard which would justify the installation of automatic sprinklers, but compulsory installation should be confined to such cases and not ordered indiscriminately.

An additional reason for caution is that a price-fixing combination among the various concerns manufacturing sprinklers has been alleged to exist. A compulsory act would benefit such a combination enormously at the expense of our cities and towns, and, as pointed out above, without a corresponding increase in the safety of the school children.

*Section 6. Partitions in Basement.* — This section applies only to schoolhouses of more than one room. The requirements are: —

(1) All wooden partitions to be covered with metal lath and cement plaster.

(2) In basements not of fireproof construction, heating apparatus to be enclosed in fireproof partitions with self-closing fire doors.

These requirements are in a general way sound, although a certain latitude is desirable to take care of cases where the construction of fireproof walls and the installation of fire doors cannot be performed without an extensive reconstruction of the entire basement.

*Section 7. Smoke Partitions in Corridors.* — Corridors leading to two or more exits are to be divided by a cross partition equipped with self-closing double swinging doors. Where exits are so placed as to enable this to be done, it is a wise precaution, as thereby smoke coming up one stairway can be excluded from the other. Where exits are widely separated, this is usually feasible. Where exits and stairways are close together, as in many buildings on opposite sides of a corridor,

partitions cannot be introduced without creating dangerous conditions, and in many cases cannot be introduced at all.

Generally speaking, the way between the child and the outer air should be as free and unobstructed as possible. Every door he has to pass through is an added danger.

*Section 8. Attic Rooms.* — These must open on corridors having two free and widely separated stairways leading to the exits of the building.

This section, apparently, does not recognize the case of an attic room having the stairways leading directly into it. If the stairways are partitioned off separately, there appears to be no grave objection to the use of such rooms.

*Section 9.* — This relates to the enforcement of the act.

*Section 10.* — This provides a penalty for officials who neglect or refuse to enforce the act.

*Section 11.* — This causes the act to apply to all schoolhouses hereafter erected, if not of fireproof construction.

The amended draft has a further section giving cities and towns the right to incur debt within the debt limit for the purpose of carrying out the provisions of this act. This would in many cases afford inadequate relief, as the requirements of the act if enforced rigidly would run into big figures. As this is a matter of emergency expenditure, debt outside the limit might well be authorized.

The foregoing analysis indicates that the objections made by the opponents are not entirely without foundation. The portion of the proposed bill relative to sprinklers seems to impose an enormous and unnecessary expense, and other portions of the bill are too rigid in their requirements. Whether the right of appeal granted is sufficient or provides a properly qualified tribunal, may be questioned.

The duty of properly safeguarding the children in our schools is an obligation which transcends any question of cost. The Commonwealth has recognized it as being of more than local concern, and has therefore undertaken in some measure its discharge. The General Court would be strangely derelict in its duty if it did not provide all proper safeguards; but careful discrimination must be exercised as to the necessity and reasonableness of the safeguards demanded, in order that no unnecessary burden be inflicted upon our already heavily laden municipalities. Some investigation has therefore been undertaken as to the need of legislation, including the nature of the risk, the present law, and the manner in which that law is administered.



## The Need of Legislation.

Schoolhouse fires are not of frequent occurrence. In 1915 there were 260 such fires in the whole United States, 14 of which were in Massachusetts. Most of these, 85 per cent. by estimation, occur out of school hours. Loss of life is therefore infrequent. The only fires in recent years where loss of life has resulted are the Peabody fire, before alluded to, and the Collingwood School fire in Ohio in 1908. No other school fire in Massachusetts, so far as known, has been attended by loss of life.

The actual danger based on past experience is therefore small. There is always the possibility, however, of a repetition of the Peabody disaster. The great danger is from panic, which can, of course, occur without any fire at all. All reasonable safeguards should, of course, be provided with a view to minimize the risk, but it should always be borne in mind that the risk is by no means excessive, and that the child in school is probably safer than in its own home.

This has some bearing on the question as to what precautions shall be taken. Of course a fireproof building is safer than one that is non-fireproof; but all of our cities and towns cannot afford to build such structures, much less tear down their old buildings and replace them; and a reasonable degree of safety can be secured by following the general line of the suggestions in the bill under consideration, with such alterations as may be necessary to meet valid objections.

It has been stated that many of our school buildings are fire traps. In some cases that is undoubtedly true. The school buildings of Massachusetts have been built at various times during the past hundred years, and many of them antedate the more modern ideas as to fire-stopping and construction of exits. There are many wooden school buildings in the Commonwealth, some of them of considerable size. Boston alone has 64, including 8 three-story and 1 four-story buildings. Many others

are very poorly protected from fire or have their staircases and exits so placed as to invite disaster in case of panic.

Assuming this to be true, the natural question is, what provision is now made for rendering these buildings, if not absolutely safe, at least as safe as possible? Two agencies exist: the cities and towns themselves, which have governmental oversight over all buildings within their limits under the provisions of chapter 655 of the Acts of 1913, and the building inspection department of the District Police, which has express jurisdiction over schoolhouses under the same statute.

The power of cities and towns is, first, to make by-laws with respect to the inspection, materials, construction, alteration, repair, height, area, location, and use of all buildings within their limits. They have also power to order unsafe buildings repaired or condemned. Therefore they have ample power to deal with private school buildings. Public school buildings they can, of course, deal with in any way they choose. Boston is governed by a special act.

The defect with this power is that it is not exercised. The cities and towns which fix by ordinance or by-law a standard for the erection of schoolhouses are few. Regulations providing for the inspection of existing schoolhouses and for the adoption of ordinary measures for protection from fire are even more scanty. Many cities and most towns provide rather meagerly for the regular inspection of buildings. The inspection of the District Police is far from complete, and their orders are seldom carried out within the time set by law. Most municipalities are so heavily burdened with requirements for more schoolhouses that they incline to be very conservative in spending money for the replacement or substantial alteration of existing schoolhouses.

The statement made above may be illustrated by the testimony of the mayor of a city of over 100,000 inhabitants, who testified before us that he was compelled to go to the voters and make a campaign to arouse public opinion in order to get funds to make the repairs on schoolhouses ordered by the District Police.

The powers of the District Police over schoolhouses cover both the erection of new buildings and the inspection and alteration of existing buildings.



The power over buildings in the course of erection is ample. Before a school building can be legally built, the plans must be submitted and approved. Compliance with the law can therefore be secured in all cases, and the inspector of plans has wide discretionary powers under which any reasonable method of fire prevention can be ordered.

The power over existing buildings is more limited. It is confined to —

(1) The maintenance of proper egress.

(2) The provision of hose or portable fire extinguishers.

(3) The protection of woodwork in the vicinity of steam or hot-water pipes.

The regulations of the District Police have gone somewhat beyond this, and appear of doubtful authority in many cases. These regulations are annexed as Appendix D.

The District Police claim that they have no authority to compel the installation of fire stops or of automatic sprinklers.

Apart from the inadequacy of the power, a greater defect is the extent to which the power is executed. The requirement of the law is that all buildings shall be inspected periodically. If in compliance with law, a certificate good for five years is issued. If not in compliance, the inspector issues orders directing specific repairs to be made, which order must be complied with in thirty days.

The intent of the law is clearly that all schoolhouses should be inspected at least once in every five years.

Figures as to the number of schoolhouses in the Commonwealth are not available. The census of 1905 listed 3,370 public school buildings and 1,034 private school buildings. It seems fair to assume that there are at least as many to-day.

The records of the State police cover only 1,692 school buildings, including both public and private. In other words, less than 50 per cent. of the school buildings of the State are inspected as required by law.

In order to develop this line of inquiry more fully, statistics have been prepared covering the public schools of the cities of the Commonwealth, exclusive of Boston. These will show in some degree how the law is enforced in our large population centers, where the number of school children cared for is greatest.

| Name of City. | Number of Public School Buildings. | Inspected. | Certified. | Orders issued. | Orders not issued more than Thirty Days. |
|---|---|---|---|---|---|
| Attleboro, | 16 | 12 | 12 | – | – |
| Beverly, | 13 | 5 | 1 | – | – |
| Brockton, | 32 | 32 | 31 | 1 | 1 |
| Cambridge, | 35 | 16 | – | 7 | 2 |
| Chelsea, | 8 | 8 | 4 | 3 | 8 |
| Chicopee, | 17 | 17 | – | 17 | 17 |
| Everett, | 20 | 8 | 5 | – | – |
| Fall River, | 54 | 15 | 13 | 2 | 2 |
| Fitchburg, | 24 | 10 | 8 | – | – |
| Gloucester, | 22 | 15 | – | 5 | 5 |
| Haverhill, | 36 | 36 | 27 | 1 | 1 |
| Holyoke, | 23 | – | – | – | – |
| Lawrence, | 32 | 31 | 6 | 25 | 25 |
| Leominster, | 11 | 11 | 10 | 1 | 1 |
| Lowell, | 58 | 58 | – | 56 | 56 |
| Lynn, | 54 | 51 | 2 | 49 | 49 |
| Malden, | 18 | 7 | 7 | – | – |
| Marlborough, | 7 | 7 | 5 | 1 | 1 |
| Medford, | 18 | 1 | – | – | – |
| Melrose, | 11 | 3 | – | 1 | 1 |
| New Bedford, | 37 | 8 | 1 | 7 | 7 |
| Newburyport, | 11 | 11 | – | 11 | 11 |
| Newton, | 32 | 27 | – | 27 | 27 |
| North Adams, | 12 | 12 | 10 | 2 | 2 |
| Northampton, | 18 | 12 | 2 | 10 | 10 |
| Pittsfield, | 23 | 10 | 9 | 1 | 1 |
| Quincy, | 17 | 17 | 17 | – | – |
| Revere, | 15 | 13 | 12 | 1 | 1 |
| Salem, | 19 | 15 | 3 | 9 | 9 |
| Somerville, | 30 | 6 | 1 | – | – |
| Springfield, | 40 | – | – | – | – |
| Taunton, | 31 | 8 | 8 | – | – |
| Waltham, | 17 | – | – | – | – |
| Woburn, | 14 | 10 | 5 | 4 | 4 |
| Worcester, | 89 | 76 | 63 | 61 | 61 |
| Totals, | 914 | 568 | 262 | 302 | 297 |



This table is compiled, as to the number of schoolhouses, from information given by school committees, and, when such information was not furnished, from their printed reports. These figures are probably only approximately accurate. In several instances the figure given was less than the number reported as inspected by the District Police, and has been corrected accordingly. The error, if any, will be in stating too small a number. The other figures are given by the District Police, and are, we assume, correct.

It therefore appears —

(1) That in the thirty-five cities outside of Boston, less than two-thirds of the schoolhouses are inspected, and less than one-third certified, as required by law.

(2) That the inspection of the District Police has omitted entirely Springfield, Holyoke and Waltham.

(3) That in addition to these three cities, Cambridge, Chicopee, Gloucester, Lowell, Medford, Melrose, Newburyport and Newton have not a single schoolhouse bearing the certificate of the District Police. Beverly, Medford and Somerville have one each. Lynn and Northampton have two each.

(4) That twenty-three cities have failed to comply with the law requiring the orders of the District Police to be complied with in thirty days. These include Worcester, with 61 orders; Lowell, with 56; Lynn, with 49; Newton, with 27; Lawrence, with 25; Chicopee, with 17; and Newburyport, with 11.

There is obviously something wrong about a system that fails to cover so great a proportion of what it is supposed to cover, on the one hand, and, on the other hand, puts well-nigh two-thirds of our cities in the position of being in violation of the letter of the law.

As to the District Police, it must be said on their side that their force of building inspectors is entirely inadequate for the work they have to do. They are supposed to inspect, besides schoolhouses, all public buildings, public or private institutions churches, theatres, special halls, public halls, miscellaneous halls, places of assemblage or of public resort, buildings in which ten or more people are employed in a factory, workshop, mercantile or other establishment, office buildings, dormitories, hotels, family hotels, apartment houses, lodging houses, board-

ing houses, and tenement houses having eight or more rooms, or accommodating ten or more persons above the second story. To do this work they have seventeen inspectors available for the entire Commonwealth. They cannot cover the whole field adequately, and must, therefore, attend first to the places involving the greatest risk. In addition to their ordinary duties, they may be called upon to perform police duties in case of strikes or other emergencies. They cover about 8,000 buildings a year, of which from 500 to 600 are schoolhouses.

Part of the responsibility must in justice, therefore, be placed on the shoulders of the General Court, which has set them a task impossible to accomplish within the given time.

As to the responsibility for failure of cities to comply with the law, it rests as a rule on the mayor and city council, who fail to provide funds for that purpose. In some cases it seems probable that there is deliberate neglect. In others, there appear to be mitigating circumstances. A city can raise money for the purpose by taxation or by a loan within the debt limit. Where a city has made up its annual budget and appropriated all the money it can raise, and has exhausted its borrowing capacity, there is no further means of raising money except by legislative authority. Therefore a city may be absolutely unable to finance the carrying out of the orders.

There is a legitimate criticism against the system on another side. A great part of the orders are made, not under express statutory enactment, but under regulations. These regulations are issued by the chief of the District Police without hearing and without the approval of the Governor and Council. There is, therefore, no opportunity for parties interested to voice their objections prior to the issuance of the rules. The interpretation of the regulations is by the inspectors, and from them there is no appeal save to the courts. The result of this has been singularly unfortunate in two ways: —

In the first place, there has grown up a regrettable diversity in the interpretation of the regulations in the several inspectorial districts. This, of course, should not be the case. The regulations should mean the same throughout the Commonwealth. This can be obtained in some measure by giving an appeal from the inspector to the chief of the District Police.



In the second place, the result is that the order of an inspector carries with it no assurance that compliance with the order will entitle the owner to a certificate. There were cases well evidenced before our committee where inspectors have been changed during the completion of the work ordered, and the incoming inspector has refused to abide by the terms of the order made by his predecessor. In one case, where inspectors were changed twice during the performance of the work, the owner had to meet the views of each of the incoming inspectors.

The intent of the law clearly is that the performance of an order issued by an inspector should entitle the owner to a certificate. The right to appeal to the court, however, is extremely expensive, and, except in a case involving a large amount of money, would probably be out of the question. As is usually the case, the worst effects are felt by those least able to protect their rights.

A complaint of a similar nature has been made with regard to the inspection of plans. The intent of the law is that a person desiring to construct a building coming within the jurisdiction of the District Police should present his plans for approval, and, after such approval, should construct his building in compliance therewith, the clear implication being that if this is done he should be entitled to a certificate. It has been claimed that the approval of plans has been made, not finally, but on a basis more or less tentative; that is to say, if the department discovered during the process of construction that the plans were not satisfactory, it felt itself at liberty to require additional changes to be made. The cost of this has not infrequently fallen on the contractor, and, in one case at least, is said to have resulted very disastrously for him. This condition, however, is said to have improved in the last two years.

The committee has included the above with some hesitation being somewhat reluctant to criticize a department that, whatever its faults, has been in the main honest and well intentioned. Inasmuch as these matters, however, were brought out in the course of our investigation, and inasmuch as they have an important bearing upon the efficiency of the inspection of the

District Police, it appeared necessary to notice them. The suggested appeal to the chief of the District Police would in all probability obviate a large part of the trouble. It is an open question, also, if powers should not be given to suspend the regulations in cases where strict application would work manifest injustice.

### Recommendations for Legislation.

In view of the above considerations, the committee feels that there is reason for new legislation. The requirements of House Bill No. 1715 are many of them already being enforced by the District Police, and, with respect to these, what is needed is not so much express legislation as an improvement of the method of enforcement. Others are not being enforced, and are probably beyond the present power of the District Police to require.

The committee's recommendations may be summarized as follows: —

(1) Legislation should be drafted as an amendment to the Acts of 1913, chapter 655.

This is desirable in order to avoid conflicts and confusion, and in order to facilitate ready reference. This will probably result in excluding the city of Boston from the scope of the bill.

Boston has a building law of its own, enacted by the General Court in 1907, and was expressly exempted from the operation of a great part of chapter 655 of the Acts of 1913, including all that pertains to the construction and inspection of schoolhouses. The policy of exempting Boston from general laws may be questioned, but is well established, and in the present case seems advisable. Boston has a special commission to look after its school buildings, and is spending substantial sums in the protection of existing buildings.

(2) The following elements in fire protection appear most essential: —

(*a*) Proper fire stops at first floor.

(*b*) Isolation of boiler rooms, storage and workrooms.

(*c*) Isolation of stairways leading from basement to first floor.

(*d*) Fireproofing of basement partitions.



(*e*) Care of rubbish and inflammable material.

These provisions, it is believed, will obviate by far the greater part of the risk from fire.

(3) Other matters touched upon by House Bill No. 1715 the committee believe can be better taken care of as an administrative matter than by strict rule of law. It, therefore, recommends an increase in the discretionary powers of the District Police over existing buildings commensurate with the powers of the inspector of plans over buildings in the course of erection.

(4) The matter of automatic sprinklers, like all matters involving the use of special appliances, should be dealt with cautiously. The General Court should not be used to promote the interest of individuals, expecially where there seems to be reason to suspect that a combination to fix prices exists. This has been alleged to be the case in the automatic sprinkler business. It seems advisable, therefore, to go no further than to empower the inspectors to order their installation in cases involving exceptional hazard, and with some check to prevent the too liberal interpretation of this power.

(5) In order to secure uniformity in requirements, and to provide a check upon arbitrary use of authority, an appeal to the chief of the District Police appears advisable, especially if the authority of the inspectors is increased.

(6) Additional inspectors should be provided for, in order that all buildings coming under their jurisdiction may be inspected at proper intervals.

(7) Some change in procedure is also advisable to insure the finality of acts of the District Police, and to establish a closer causal connection between the obedience to their orders and the granting of a certificate.

This is, however, a matter more properly for the District Police to look out for themselves than for the General Court to secure by statute. They should be able to see the force of the argument, that if they themselves do not consider orders issued by members of their own department as final and binding, nobody else can hold those orders in high esteem.

The committee's bill is annexed hereto as Appendix E.

CONCERNING OTHER LEGISLATION NOW BEING CONSIDERED BY THIS AND OTHER COMMISSIONS.

Propositions are before the committee involving a transfer of the building inspection department to a new commission, and the enactment of a new building law.

The Commission on a State Constabulary is also considering the transfer of the inspection of buildings from the District Police.

We have of necessity drafted this bill on the theory that the present status remain unchanged. If the general building law now being considered by our committee is enacted into law, this bill should not be enacted. If the proposition relative to a State constabulary is enacted into law, some modification of this bill may be necessary.

CLARENCE W. HOBBS, JR.
JAMES R. TETLER.
JAMES P. TIMILTY.
GEO. D. CHAMBERLAIN.
CHARLES H. ANNIS.
FREDERIC F. CLAUSS.
JOHN HALLIWELL.
JACOB BITZER.
GEORGE J. WALL.



# APPENDIX A.

REPORT OF FANEUIL HALL COMMITTEE ON SAFEGUARDING SCHOOLHOUSES FROM FIRE.

The Great Boston Fire occurred Nov. 9, 1872. In recent years it has been the custom to observe that date as Fire Prevention Day in Massachusetts.

The Peabody schoolhouse fire, which was attended with disastrous loss of life, occurred Oct. 28, 1915. It seemed to the Fire Prevention Commissioner that a very practical way of observing Fire Prevention Day in 1915 would be to call a conference of officials of the cities and towns in the Commonwealth, and of citizens distinguished in the various lines of work that had to do with schools and construction, who should consider the present conditions of Massachusetts schoolhouses, and recommend methods for safeguarding them. For such a conference there could be no more fitting place than Faneuil Hall. The meeting was opened by Governor Walsh, and papers were read on the matter under consideration by the following persons: David Snedden, State Commissioner of Education; Frank Irving Cooper, architect for the Russell Sage Foundation; Prof. C. B. Breed, Massachusetts Institute of Technology; Gorham Dana, manager of the Underwriters' Bureau of New England; Dr. Thomas F. Harrington, health director of State Board of Labor and Industries; R. Clipston Sturgis, architect, former chairman of Schoolhouse Commission; and Lyon Weyburn, legislative counsel for Boston Chamber of Commerce.

After the papers had been read a discussion followed, and the meeting voted to appoint a committee of fourteen, with the Fire Prevention Commissioner as chairman, to consider what measures should be taken to safeguard existing schoolhouses, and to insure proper construction of new schoolhouses. The committee was authorized, after reaching conclusion, to take such action as seemed wise. It was made up as follows: —

John A. O'Keefe, Fire Prevention Commissioner, *Chairman.*
Jesse A. Barrett, chief of Peabody fire department.
Prof. C. B. Breed, Massachusetts Institute of Technology.
Dennis E. Carey, chief of Lawrence fire department.
Frank Irving Cooper, architect for Russell Sage Foundation.
Gorham Dana, manager, Underwriters' Bureau of New England.
John Grady, fire commissioner of Boston.
Dr. Thomas F. Harrington, health director of State Board of Labor and Industries.

George L. Johnson, chief of Waltham fire department.
William H. Sayward, secretary, Boston Master Builders' Association, and chairman of Special Commission to frame New Building Code for Massachusetts.
David Snedden, State Commissioner of Education.
R. Clipston Sturgis, architect, former chairman of Boston Schoolhouse Commission.
John O. Taber, senior deputy chief, Boston fire department.
Franklin H. Wentworth, secretary, National Fire Protection Association.
Lyon Weyburn, legislative counsel of Boston Chamber of Commerce.

This committee was afterwards enlarged by the addition of the following persons: —

William Brophy, secretary, Fire Chiefs' Club.
Nathaniel Bunker, chief of Cambridge fire department.
Hiram L. Dorman, schoolhouse commissioner of Springfield.
Joseph P. Glavin, expert sprinkler worker.
George C. Halcott, superintendent of public buildings, Worcester.
H. P. Jennings, president, Boston Central Labor Union.
Edward N. Kelly, expert wire lather.
Charles A. Logue, formerly of Boston Schoolhouse Commission.
Joseph McGinniss, architect.
James McNamara, electrician.
Edward C. Minehan, chief of Marlborough fire department.
James Moriarty, expert sheet metal worker.
Sewall M. Rich, chief of Somerville fire department.
W. C. Shepard, chief of Pittsfield fire department.
T G Toomey, in charge of fire protection in Filene's store.

At its first meeting this committee appointed a subcommittee of five, consisting of R. Clipston Sturgis, chairman, Prof. C. B. Breed, Frank Irving Cooper, Dr. Thomas F. Harrington and John O. Taber, to frame suggestions and regulations for safeguarding existing school buildings. The report of that committee, modified and adopted by the full committee, follows.

It is earnestly recommended to school committees and other municipal authorities throughout the Commonwealth that existing school buildings be equipped and maintained in accordance with the provisions of this report.

JOHN A. O'KEEFE,
*Chairman of Faneuil Hall Committee.*

## A CIRCULAR OF ADVICE AS TO SAFEGUARDING THE CHILDREN IN OUR SCHOOLS.

*To School Committees, Teachers and Parents.*

Read this. Does it apply to your buildings? Are your children safe? If not follow the advice given. If your case is not covered, or you want more information, write to the office of the Fire Prevention Commissioner, 1 Beacon Street, Boston.



I. Safeguarding against fire.
  (1) Basements classed according to occupation.
    (*a*) Containing only heating apparatus and storage.
    (*b*) Containing heating apparatus and children.
    (*c*) School occupation but no heating apparatus.
  (2) Attics by occupation.
    (*a*) Storage only, or unoccupied.
    (*b*) Containing children.
  (3) Roofs, occupied.
  (4) Classroom floors.
    (*a*) Sprinklers and fire extinguisher.
    (*b*) Stairways.
  (5) Housekeeping.
    (*a*) Waste paper.
    (*b*) Oil and paints.
    (*c*) Janitor present.
    (*d*) Gas.
  (6) General recommendations as to little children.

II. Safeguarding life when fire is started.
  (1) Prevention of spread of fire or smoke.
    (*a*) Doors and partitions.
    (*b*) Sprinklers and fire extinguishers.
  (2) Means of exit.
    (*a*) Doors from classrooms, to stairs, from building.
    (*b*) Corridors.
    (*c*) Stairs.
    (*d*) Fire escapes.
  (3) Fire signals and drill.

### I. Safeguarding against Fire.

#### (*1*) *Basements classed according to Occupation.*

(*a*) *Containing only Heating Apparatus and Storage (no Children).* — Basements of this class should be entirely cut off from the first floor and be entered only from outside. If first floor frame is wood, even if now plastered on wood lath, it should be plastered again on metal lath. All wood partitions should either be replaced with masonry or covered with metal lath and plaster, especial care being taken to fire-stop all openings, such as heating ducts, which connect basement and first floor. All spaces where inflammable material could be placed should be protected with sprinklers.[1]

(*b*) *Containing Heating Apparatus and Children.* — Basements of this class should preferably be treated as (*a*), *i.e.*, cut off entirely from first floor; but if existing stairs from first floor to basement are necessary, or it appears to be impracticable to send the children outdoors before going down to the basement, the stairs should be freed of any enclosed space under, and if of wood, should preferably be replaced by a fireproof stair. In any case the stairs should be shut off with partition protected by metal lath and plaster and a fireproof spring-closing door, so that neither

[1] Where sprinklers are mentioned, automatic sprinklers installed in accordance with the rules of the National Board of Fire Underwriters are meant.

fire nor smoke can find its way up. Such doors should not be hooked open during school session. There should also be direct exit from space occupied by children to outside. With shops, cooking and manual training, storage for wood and other material, another element of danger is introduced, *e.g.*, fire in the kitchen, inflammable material in the shop. All such rooms should be protected with sprinklers. The portion of basement occupied by shops should be cut off with partitions protected by metal lath and plaster, and fire doors; and preferably have direct exits to grade without the necessity of using the stairs to the first floor or going into the other parts of the basement.

(*c*) *School Occupation but no Heating Apparatus.* — With the removal from basements of the heating apparatus, and fuel storage which accompanies it, the chief sources of fire are removed, and no special precaution is necessary except to equip with sprinklers the shops and places where wood or other inflammable supplies are stored or used.

(*2*) *Attics by Occupation.*

(*a*) *Storage only, or unoccupied.* — In attics of this class, framed of wood and used only for storage, such use should be abandoned, or they should be protected by sprinklers (or dry-pipe system with steamer connections), and stairs or other means of access from upper story to attic should be cut off with protected partitions and fire doors. In some cases automatic ventilators should be installed.

(*b*) *Containing Children.* — In attics of this class the portion occupied by classes or as halls or assembly rooms should be cut off with metal-lathed and plastered partitions and spring-closing fire doors from the rest of the attic, the unoccupied attic portion being protected as under (*a*).

(*3*) *Roofs by Occupation.*

Unless of fireproof construction or provided with exits as the other floors of the building, roofs should not be occupied by children.

(*4*) *Classroom Floors.*

*Floors Other than Basement or Attic.* — Classroom floors are generally so fully occupied with people that the starting of a fire on any of these floors during school hours is unlikely, and if started may generally be easily put out.

(*a*) Care should be exercised with inflammable material; closets containing such material should be eliminated and stock kept in plain sight, and rooms in which, owing to the use of such stock, fire might start (such as shops, kitchens, laboratories, etc.) should be equipped with sprinklers. Each floor should also be provided with fire extinguishers.

(*b*) If basement and basement stairs are protected and attics protected, the stairs elsewhere should simply be kept free of all obstructions.



(*5*) *Housekeeping.*

(*a*) *Waste Paper.* — Inflammable material such as paper and other waste should be placed in metal containers, or in plain sight, and emptied every day.

(*b*) All oils and oil waste and oil-saturated floor mops should be kept in metal receptacles and always in plain sight in open spaces.

(*c*) In buildings having more than four rooms, or exceeding one story in height, the janitor or his assistant should be in the building at all times during the session.

(*d*) Where gas is used provide a shut-off outside the building, with a wrench for closing same, readily accessible, near main entrance, and clearly marked.

(*6*) *General Recommendations as to Little Children.*

Children of second grade and under should not be housed above the first floor. There should be exits from the first floor rooms directly outside. Portable schools with stoves in them should have two exits.

## II. Safeguarding Life when Fire is started.

(*1*) *Prevention of Spread of Fire or Smoke.*

(*a*) *Doors and Partitions.* — Doors to basement and attic stairs, already advised to be fireproof and arranged with springs so as to be kept always closed, will provide against the chief danger of the rapid spread of fire or smoke. Other doors or partitions cutting off stairs are not advised, but an additional safeguard can be provided by making one cross wall, or at least by constructing walls, with swinging fire doors, across the middle of long corridors. As this might well be protection against fire as well as smoke this partition should be protected with metal lath and plaster, and have in the corridor a spring-closing fire door. To make this effective in time of fire the classrooms must be connected. This should be done with the utmost care (see next section), as a class of children suddenly dismissed by an unaccustomed door into another room occupied with fixed furniture and children might easily be a worse evil than the one escaped.

(*b*) *Sprinklers and Fire Extinguishers.* — The use of these in stopping the spread of fire, and the places where they should be installed, is covered under (I.).

(*2*) *Means of Exit.*

(*a*) *Doors from Classrooms, Doors to Stairs, Doors from Building.* — Doors from classrooms which seat only an ordinary class may open either in or out, and preferably there should be but one door to the corridor. If there is only one door to the corridor the class is more under the teacher's control. If there are two doors, or if the doors open out, the teacher may

lose control. Control at this point is the chief factor of safety. If the door opens out it should not block the corridor space but be recessed. If, as advised in a previous paragraph, communicating doors between rooms are added to give cross connection these should be opposite the aisles or open into a clear space. Doors from assembly halls should always open out and have self-releasing devices so that they can always be opened by pressure from within. Where there are partitions shutting off stairs the doors in such partitions should open from corridor to stair directly opposite the stair going down, and should have no locks or latches, but be equipped with spring-closing devices only, and should open so as not to block the landings. Doors to fire escapes, *i.e.*, definite exits for use in emergency rather than for daily use, should have self-releasing device to open out. Vestibule doors should open out and have no fastener; these are safer than double swing. Outside doors should open out. There should be no dead locks but only spring locks operated by the inside handle. Where doors are double the standing door should have top and bottom bolts arranged for quick release, but a self-releasing device for both doors is better still.

(*b*) *Corridors.* — Should be kept clear of all inflammable material and all obstructions.

(*c*) *Stairs.* — Should be free from obstruction, especially those which (like doors opening on to landings) might reduce the available width of landings below that of the stairs. Handrails should be placed on both sides at a normal height. Stairs wide enough for four abreast, or over five feet, are dangerous in any case, and should have a center rail. It is obvious that no general instructions can be given, as each case will be particular. In general, it may be said that the lives of the children are better guarded by safeguarding the stairs in daily use than by building emergency fire escapes.

(*d*) *Fire Escapes.* — Where the regular interior stairs are manifestly unsafe, insufficient and not capable of material improvement, an iron fire escape may be accepted as an additional safeguard, but this should not be done unless it has first been proved, through consultation with competent authorities, impossible to safeguard the stairs in daily use. Fire escapes should be of the stair type and lead directly to the ground. If the building to be equipped with fire escape has more than two stories of classrooms the fire escape should be of the smoke-proof tower type. Existing fire escapes which pass windows from which fire and smoke may issue should be classed as useless and disregarded as a safe means of exit.

### (*3*) *Fire Signals and Drill.*

All schools over one story high should be equipped with fire-alarm signal. This should be the 4–4 already adopted in many places. Let this be the fire call recognized throughout the State. It is desirable that this apparatus be connected with the town fire department and be tested



weekly by, and under the control of, that department. Its effectiveness depends on its being in order.

Fire drills should be an accustomed exercise. The time taken might be considered as a lesson in order and discipline and marked, as is punctuality. Drill should be called to include all school activities, that is, sounded when children are in the classrooms, in the hall, in the gymnasium. The school physician as well as the master should consider that the responsibility for this rests with him.

## APPENDIX B.

AN ACT TO DEFINE THE TERM "SCHOOLHOUSE" AND RELATIVE TO THE CONSTRUCTION OF SCHOOLHOUSES.

*Be it enacted, etc., as follows:*

SECTION 1. The term "schoolhouse" when used in this act shall include any building, or part of a building, used as a public or private school, academy, seminary or college, containing one or more rooms, where a regular course of instruction is afforded to more than ten pupils at one time.

SECTION 2. The requirements herein set forth shall be put into effect before the first day of January, nineteen hundred and seventeen; but in the city of Boston the building commissioner, and in other parts of the commonwealth the chief of the district police, may, for sufficient reason, grant an extension of time within which said changes shall be made.

SECTION 3. In schoolhouses not exceeding one story in height and containing more than one school room, if the heating apparatus be located in the basement, the ceiling of the basement, if constructed of combustible material, shall be protected with metal lath and cement plaster at least three quarters of an inch in thickness; all spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways, shall be thoroughly fire-stopped with brick in mortar, or its equivalent; and self-closing fire doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above.

SECTION 4. In schoolhouses that exceed one story in height the basement shall be cut off from the floor above in the following manner: the ceilings, underside of stairways and landings, if constructed of combustible material, shall be covered with metal lath and cement plaster, at least three quarters of an inch in thickness; all spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways, shall be thoroughly fire-stopped with brick in mortar, or its equivalent; and self-closing fire doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above.



SECTION 5. In schoolhouses exceeding one story in height where there are stairs or stairways connecting the first floor with the basement, the entire basement and all rooms above the basement used for manual training, laboratories, [or other hazardous purposes,] shall be equipped with automatic sprinklers provided with an adequate water supply, and installed in accordance with the standard regulations adopted by the district police. Such sprinklers shall be adequately protected against freezing, and shall be kept in commission and under pressure whenever the building is occupied for school purposes.

SECTION 6. In schoolhouses containing more than one room, partitions of wooden sheathing shall not be allowed in the basement, unless they be covered with metal lath and cement plaster, or its equivalent; and if heating apparatus be located in the basement such apparatus shall be separated from other parts of the basement by fireproof partitions, the openings in which shall be equipped with self-closing fire doors.

SECTION 7. In all schoolhouses, corridors leading to two or more exits shall be divided by a cross partition equipped with self-closing double swinging doors.

SECTION 8. Rooms situated in the attic shall not be used for class room purposes unless such rooms open on corridors that have two free and widely separated stairways leading to the exits from the building.

SECTION 9. In the city of Boston it shall be the duty of the building commissioner and in other parts of the commonwealth it shall be the duty of the building inspection department of the district police to enforce the provisions of this act.

SECTION 10. If any city or town, or any official or officials in any city or town whose duty it is to appropriate money for the construction of schoolhouses or to authorize such construction, refuses or unreasonably neglects to carry out the provisions of this act, such city or town, or such official or officials, upon information presented by the building commissioner in the city of Boston, and by the chief of the district police in other parts of the commonwealth, shall be liable to a fine not exceeding one thousand dollars. It shall be the duty of said building commissioner and of said chief of the district police to present information in such cases.

SECTION 11. The requirements of this act shall apply also to all schoolhouses hereafter erected, if not of fireproof construction.

## Appendix C.

### An Act for the Better Protection of Schoolhouses.

*Be it enacted, etc., as follows:*

Section 1. In this act the term "schoolhouse" shall have the same meaning as is defined in section forty-one of chapter six hundred and fifty-five of the acts of the year nineteen hundred and thirteen.

Section 2. In schoolhouses one story in height and containing more than one school room, if the heating apparatus is located in the basement, all spaces under walls and partitions and over girders around heat and vent pipes, and around stairways, shall be thoroughly fire-stopped with brick in mortar, or its equivalent, and self-closing doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above.

Section 3. In schoolhouses two or more stories in height, all spaces under walls and partitions, over girders, around chimneys, heating and vent pipes, and around stairways shall be thoroughly fire-stopped with brick in mortar, or its equivalent; and all stairways leading from the basement to the first floor, and elsewhere if directed, shall be enclosed in fireproof walls, with fireproof self-closing doors at the top or bottom of each stairway. If the inspector so directs in writing, the basement ceiling, if of combustible material, shall be covered with metal lath and cement plaster at least three-fourths of an inch in thickness; and the basement and such other portions of the building as he may deem necessary shall be equipped with an approved system of automatic sprinklers; such sprinklers to be adequately protected against freezing, kept in good condition and under pressure whenever the building is occupied for school purposes. No wooden sheathing partition shall be allowed in the basement of any schoolhouse unless covered with wire lath and cement plaster, except partitions around toilets.

Section 4. Every schoolhouse shall be provided with suitable incombustible receptacles for ashes, rubbish, and all other refuse material; and no part of any schoolhouse or premises thereof shall be used for the storage of any article or material dangerous to life or limb in case of fire or otherwise.



Section 5. The school committee, officers, or board having charge of schoolhouses shall comply with the requirements of this act before the first day of January, nineteen hundred and seventeen: *provided, however,* that the chief of the district police may for sufficient reasons grant an extension of time within which such changes shall be made. The necessary expenses incurred in complying therewith, if not otherwise available, shall be chargeable against the appropriation for school purposes, and any such committee, officers, or board failing to comply with the requirements of this act shall be punished by a fine of or by

Section 6. The governor is hereby authorized to appoint five additional members of the district police who shall be employed as building inspectors of the building inspection department. Their terms of office, salaries, powers and duties shall be the same as those provided by law for the district police.

Section 7. This act shall not apply to the city of Boston.

Section 8. This act shall take effect upon its passage.

# APPENDIX D.

DISTRICT POLICE REGULATIONS RELATING TO THE ERECTION, ALTERATION AND INSPECTION OF SCHOOLHOUSES, TAKING EFFECT NOV. 1, 1913.

These regulations, unless otherwise specified, relate to graded or high school buildings of medium size, and the following mentioned buildings shall conform thereto so far as applicable.

*Schoolhouse.* — Any building, or part of a building, used as a public or private school, academy, seminary or college, containing one or more rooms, where a regular course of instruction is afforded to more than ten pupils at one time.

*Basements.* — Shall be well lighted and may contain the gymnasium, and the domestic science, manual training, lunch, recreation, sanitary, storage, work, boiler and fuel rooms, and wardrobes. The floors, including those of the fresh air and heating chambers, if so directed, shall be of concrete with an approved covering of sheet asphalt or Portland cement, except as hereinafter specified. Suitable floor drains with traps shall be provided where circumstances require. The gymnasium, and the domestic science and manual training rooms, if so directed, shall have approved wood floors. The ceilings, unless the first floor of the building is of fireproof or mill construction, shall be of metal lath and hard plaster. In buildings hereafter erected the basements shall be not less than 10′ 0″ in height.

*Corridors.* — Shall be well lighted, and in each case, if so directed, shall terminate on an egress. In buildings hereafter erected, the corridors shall be not less than 10′ 0″ in width, in the clear, for buildings with eight class rooms, and shall increase at least 1′ 0″ in width for every two additional class rooms, and may decrease 1′ 0″ in width for every two class rooms less than that number; and shall be free from sharp turns, where circumstances will permit.

*Class and Recitation Rooms.* — Shall be lighted from outside by windows, and in buildings hereafter erected, and in existing buildings if so directed, such windows shall have not less than one square foot of glass to each five square feet of floor area, and the top of the windows shall be not more than 8″ below the ceiling. For rooms lighted from one side only their width from that side shall be not more than two and one-third times their height. The ceilings shall be free from girders, beams or other obstruction to the free circulation of air.



*Assembly Hall.* — When not above the second story of the building, may have a stage or recessed platform, on which such fireproofed scenery and other stage appliances as the inspector shall approve may be used, and with such proscenium protection as the inspector shall, in each case, direct. If the assembly hall is above the second story of the building, it may be used for such entertainments not requiring the use of scenery and other stage appliances as the inspector may approve, and for public gatherings: *provided, however,* that an assembly hall in the third story of a building of exceptional construction and egresses, having a stage with approved fire-resisting proscenium wall or partition and an asbestos proscenium curtain operated by approved mechanism, with an approved automatic ventilator over the stage equal in area to one-tenth that of the stage floor, and with such permanent fireproof scenery and other stage appliances as the inspector shall approve and set forth in detail on the certificate issued for such hall, may be used.

*Aisles and Seating.* — Seats for assembly halls and lecture rooms shall be not less than 2′ 6″ from back to back, measured horizontally, and no seat shall have more than seven seats between it and an aisle. The aisles shall be of such width as the inspector shall direct. For an assembly hall having portable seats, floor cleats or other approved device for securing the seats in place shall be used. For an approximate estimate of seating capacity for an assembly hall, six square feet of floor space shall equal one seat. The aisles in class and recitation rooms, unless otherwise directed, shall be not less than the following in width: —

In primary schools, wall aisles 2′ 4″, center aisles 1′ 5″.

In grammar schools, wall aisles 2′ 8″, center aisles 1′ 7″.

In high schools, wall aisles 3′ 0″, center aisles 1′ 9″.

*Egresses.* — Free and unobstructed ways by doors, corridors and stairways to places of safety, and in these regulations also given as exits. Buildings hereafter erected shall have at least two independent egresses, as far apart as may be, aggregating at least 2′ 0″ in width for every one hundred persons that the building will accommodate, including the assembly hall and gallery if such are to be used for other than school purposes during the time when school is in session, and no such egress shall be less than 3′ 6″ in width, except in one and two room buildings where such egress shall be not less than 3′ 0″ in width. Assembly halls, gymnasiums, galleries and basements shall have at least two independent egresses as far apart as may be. One half of the gymnasium and basement egresses, if so directed, shall be direct to the outside; and where areas and steps are necessary they shall have approved hand-rails. Class, recitation, domestic science and manual training rooms and laboratories, if so directed, shall have at least two ways of egress, one of which may be through an adjoining room. A landing at least 6″ wider than the door, when open, must be between any exterior egress door and a step downward in front of the door. Each egress from the assembly hall, gymnasium, galleries, and elsewhere if so directed, shall be provided with a sign having on it the word "EXIT"

in letters at least 5″ in height, and so as plainly to indicate to persons within the building, at all times, the location of such exits.

*Stairways.* — Shall have hand-rails on both sides; the wall-rails shall have an approved number of heavy wrought or bronze brackets, and the upper ends shall have circular returns secured with rail bolts or wall plates. In buildings hereafter erected, the stairways from the basement to the first story, and elsewhere if so directed, shall be enclosed with fireproof walls with fireproofed self-closing doors, or wire glass not less than ¼″ thick, set in metal frames or metal covered doors, may be used in place thereof. The steps of stairs shall have a rise not less than 6″ nor more than 7″ and a run not less than 10″, and there shall be not more than fifteen nor less than three risers between landings; when returning on wells or directly upon themselves, the landings shall be the full width of both flights and no winding steps shall be used, and no closets shall be placed under any stairs. In buildings hereafter erected, and in existing buildings if the inspector so directs, when the assembly hall is above the second story, there shall be one or more stairways from the assembly hall equal to 1′ 0″ in width for every one hundred persons which the assembly hall is capable of seating, but no such stairway shall be less than 4′ 0″ in width; the stairways shall be enclosed in fireproof or fire-resisting walls, and shall run directly to and connect with the ground, and shall have no connection with any other part of the building. Measurements for width of stairs shall be taken between hand-rails. Balustrades shall be not less than 3′ 0″ in height on landings or 2′ 8″ on runs plumb over risers.

*Egress Doors.* — Shall open outwardly, and where necessary to fasten, the standing leaf of each pair of doors shall have surface bolts, both top and bottom, connected with a center T-turn, lever or push bar, and no other bolts or hooks shall be used; single doors shall have night latches, operated by a full size T-turn, knob, lever or push bar, and no bolts, hooks or dead locks shall be used; all the above to be operated from the inside of the doors and within 4′ 0″ in height from the floor. Doors connecting class or other rooms shall have double-acting hinges but no bolts, hooks or locks; and exterior, vestibule and corridor doors, if so directed, shall have plate glass upper panels, not less than ¼″ in thickness. No rolling, sliding or revolving doors shall be installed as egress doors.

*Gradients.* — Shall be used instead of steps to overcome differences in levels of not more than 1′ 6″, and no such gradient shall exceed 1″ in 10″. Sills of connecting doors shall be so designed as to be level and flush with the adjoining floors.

*Boiler, Fuel, Storage and Work Rooms.* — In buildings hereafter erected, and in existing buildings if so directed, no boiler, fuel, storage or work rooms shall be placed under a corridor, stairway or egress, and wherever located, if so directed, they shall be enclosed in masonry or fireproof walls with fireproof ceilings, and all openings in the walls to the basement shall be provided with self-closing fireproof or automatic fire doors. The floors of boiler and fuel rooms, if so directed, shall be of hard burned brick set on edge in cement.



*Heating and Ventilation.* — For a mechanical system with the temperature of the outside air at zero, or for a gravity system with the rooms at seventy degrees Fahrenheit and with the temperature of the outside air not less than forty degrees F. below that of the air entering the rooms through the inlets necessary to maintain seventy degrees F. in the rooms, the apparatus shall insure the removal near the floor levels, through ventiducts by the aid of heat or its equivalent, with approved regulating dampers, of not less than thirty cubic feet of air per minute for each person accommodated in the class, recitation, domestic science and manual training rooms and laboratories, and of not less than two and one-half cubic feet of air per minute for each foot in area of the assembly hall and gymnasium floors. Such apparatus shall also have means to supply, through properly located inlets, pure air equal to the amount removed, and at such height from the floors as to insure proper circulation, with means for the proper heating of such air when necessary, and with approved regulating, protecting and mixing dampers or other approved methods for regulating the temperature, so that no uncomfortable draughts will be felt and that the difference in temperature between any two points on the breathing plane, not less than 2′ 0″ from an outside wall, will not exceed three degrees F.; and it shall have sufficient means for heating as to maintain a temperature throughout such rooms of seventy degrees F. in zero weather. The velocity of the air entering the ventiducts in the class, recitation, domestic science and manual training rooms and laboratories shall not exceed four hundred feet, in the assembly hall and gymnasium shall not exceed five hundred feet, and through the grilles of the inlets shall not exceed three hundred and fifty feet, per minute. The offices, teachers' and emergency rooms, corridors and wardrobes shall have approved ventilation, and shall be provided with sufficient heat for their respective uses. The first-story corridors shall have an approved number and class of foot-warmers, where applicable. Direct radiation may be installed in the class, recitation, domestic science and manual training rooms and laboratories, assembly hall and gymnasium only in such amounts as to heat the rooms to a temperature of sixty degrees F., and in recreation, sanitary and toilet rooms to at least seventy degrees F., in zero weather. Provisions may be made for reversing any of the above circulation for use when heat is not required, or for an indirect heating system having a plenum or supply chamber below the floor, delivering an approved amount of air to the rooms through perforated chair or desk standards, or their equivalent, and exhausting the same through grilles in the center and near each corner of the ceiling, with approved means for regulating the circulation of the air and temperature of the rooms. A hood of such size as to carry off all odors, fumes and gases, shall be placed over each stove in the domestic science room and over each demonstration table and compartment in the chemical laboratory and chemical laboratory lecture room. These hoods shall be connected by approved size ducts with ventiducts independent of those for the room ventilation, or, if the combined area of the hood ducts in a room is sufficient,

and so arranged, no other exhaust from the room will be required. All fresh air rooms, heating chambers and heating and ventilating ducts or flues shall be of masonry, or metal of suitable gauge, thoroughly stayed and secured in place. All wall-inlet grilles shall be not less than 1′ 0″ more in height than the depth of the flue. Steam, hot water, electricity, furnaces or jacketed stoves may be used for heating. Provision shall be made, if so directed, for the installation of a primary heating and air washing apparatus.

*Sanitation.* — Where suitable water supply and sewerage are available, the sanitary rooms may be located in the basement or in any story of the building, and in buildings hereafter erected, and in existing buildings, if so directed, they shall be suitably lighted from outside; the sanitary rooms and gymnasium toilets shall have floors and base of non-absorbent material; the base shall be not less than 6″ in height, with sanitary cove at the floor level, and suitable hose connections and floor drains with traps shall be provided. The boiler room shall have a suitable sink, and each sanitary or recreation room and each corridor shall have sinks of an approved size or an approved number of lavatories, and the recreation rooms and corridors shall have an approved number of drinking fountains. The sanitary rooms shall have the following fixtures for a mixed or co-educational building, based upon the assumption of there being an equal number

| Pupils. | Water Closets. | | Urinals. | Slabs. | |
|---|---|---|---|---|---|
| | Girls. | Boys. | | Feet. | Inches. |
| 50, . . . . . | 3 | 2 | 2 | 2 | 8 |
| 100, . . . . . | 4 | 3 | 4 | 5 | 4 |
| 200, . . . . . | 6 | 4 | 6 | 8 | – |
| 300, . . . . . | 9 | 6 | 8 | 10 | 8 |
| 400, . . . . . | 12 | 8 | 10 | 13 | 4 |
| 500, . . . . . | 14 | 9 | 12 | 16 | – |
| 600, . . . . . | 16 | 10 | 14 | 18 | 8 |
| 700, . . . . . | 18 | 11 | 16 | 21 | 4 |
| 800, . . . . . | 20 | 12 | 18 | 24 | – |
| 900, . . . . . | 22 | 13 | 20 | 26 | 8 |
| 1,000, . . . . . | 24 | 14 | 22 | 29 | 4 |

of pupils of each sex. For buildings having a greater number, or majority fraction of a hundred pupils, or occupied by either sex exclusively, the same ratio respectively shall be observed. Such fixtures shall be flushed automatically from special tanks, and the slab urinals through suitable size brass pipes perforated every 3″ with blow-offs at the ends for



cleaning. Local vents for each water closet and for each 1′ 4″ in length of slab urinals shall be not less than eleven square inches, and shall be connected with a duct of combined area, having a rise of 1″ to each 1′ 0″ run to a ventiduct provided with mechanical or other approved means for maintaining proper circulation. Range water closets and separate urinals shall have an approved equivalent of the above flushing and local vents. The toilets connected with the offices, teachers' and emergency rooms shall have a water closet with local vent as above, with usual tank flush and an approved lavatory. Where suitable water supply and sewerage are not available, approved earth closets or privies and urinal trough shall be placed upon the school grounds not less than 30′ 0″ from the building. Except as otherwise specified or directed, the installation of the above fixtures, together with the required fixtures in the laboratories, gymnasium toilets and kitchen, shall be in accordance with plumbing ordinances or rules of the city or town in which the building is located, if such exist; otherwise in accordance with the plumbing rules formulated by the State Examiners of Plumbers.

*Fire Alarm.* — A building having a basement, or more than one story in height, shall have such gong or gongs and such switches or other mechanism for operating the same as the inspector shall direct and locate; and where there is more than one gong, the system shall be so arranged that each gong shall be operated simultaneously from each of the operating stations; such operating stations shall be distinctly marked "Fire Alarm," and the system shall not be used for any other purpose.

*Fire Protection.* — The basement and each story of a building shall have such means for extinguishing fire, consisting of stand pipe and hose or approved fire extinguishers, or both, as the inspector shall direct and locate, and such appliances shall be kept at all times in good condition and ready for use. Where stand pipes and hose are installed, approved hose racks and test cocks shall be provided. There shall be no inflammable decorations or draperies used in the building.

*Lighting.* — The corridors, stairways and egresses shall be suitably lighted, and the assembly hall, gymnasium and each gallery shall have a suitable number of emergency lights, to be controlled near the main entrance of the assembly hall and gymnasium, and, if electric lights are used, the above lighting, together with the illumination of the exit signs, shall be supplied from a source separate from that of the general service, if circumstances will permit; or, where gas is available, it shall be used as an auxiliary to the general service, or for the full lighting. All lights used on the stage or platform, when scenery or other stage appliances are used, shall be suitably guarded. The installation of electrical apparatus for furnishing light, heat or power, and all wiring and work connected therewith shall be in accordance with the rules of the National Board of Fire Underwriters; and, in buildings hereafter erected, or where alterations are being made, if so directed, they shall be in accordance with their rules, known as "National Electrical Code" as used in a theatre. Where the

general and other lighting is by lamps, they shall be of metal, secured in place, and where necessary to use as emergency lights or for illuminating exit signs, they shall be provided with suitable shades, so as to burn continuously.

*Fire Stops.* — In buildings hereafter erected, fire stops shall be provided, as directed, in floors, walls and stairways, and if partitions around stairs are not of brick, or its equivalent, they shall be filled in solid between the studs and plastered with cement plaster upon metal lath; and such further means throughout the building, as may be necessary to prevent the spread of fire or its communication from any steam boiler or heating apparatus therein, shall be provided.

*Boilers and Machinery.* — Steam boilers and their installation and fittings shall be in accordance with the rules formulated by the Board of Boiler Rules. Engines, motors, pumps, blowers or fans, and all other heavy or high speed machinery shall have approved foundations of masonry, or rest on steel beams of approved size, supported by masonry; all to be guarded as the inspector shall direct.

*Fire Escapes.* — In existing buildings where a fire escape may be considered as equivalent to a required exit, it shall be of such width and construction as the inspector shall direct, and the upper balcony of the fire escape shall connect with the floor from which it leads by doors level with such floor and balcony, and the stairs shall extend to the ground.

*Roof or Open Air School Rooms.* — Construction, egresses and equipment shall, in each case, be as directed.

*Plans and Specifications.* — For a building designed to be used, in whole or in part, or for a building in which alteration shall be made for the purpose of using it or continuing its use, in whole or in part, as a schoolhouse, shall be deposited with the Supervisor of Plans, Building Inspection Department of the District Police, State House, Boston, in accordance with section 15, chapter 655, Acts of 1913. Such plans shall show the designated number of each class and recitation room, the designated name of other rooms, and the number of pupils that each class and recitation room is to accommodate; and where steam or hot water is to be used for heating, they shall show the location, amount and class of radiation and the size of feed and return pipes.

J. H. WHITNEY,
*Chief of the District Police.*



## APPENDIX E.

### AN ACT RELATIVE TO BETTER FIRE PROTECTION IN SCHOOLHOUSES AND ELSEWHERE.

*Be it enacted, etc., as follows:*

SECTION 1. Section twenty of chapter six hundred and fifty-five of the acts of the year nineteen hundred and thirteen is hereby amended by inserting after the word "same", in the twenty-first line, the words: — The inspector may require that stairways shall be enclosed, that they shall have suitable landings, that egress doors and windows shall have approved hardware, and that proper fire stops shall be provided in the floors, walls, partitions, and stairways of such building. He may make such further requirements as may be necessary to prevent the spread of fire, or its communication from any steam boiler or heating apparatus therein, — and by inserting after the word "egress", in the thirty-second line, the following: — Suitable incombustible receptacles shall be provided for ashes, rubbish, or other refuse material, — so as to read as follows: — *Section 20.* A building which is used, in whole or in part, as a public building, public or private institution, schoolhouse, church, theatre, special hall, public hall, miscellaneous hall, place of assemblage, or place of public resort, and a building in which ten or more persons are employed in a factory, workshop, mercantile or other establishment, and an office building, dormitory, hotel, family hotel, apartment house, boarding house, lodging house or tenement house which has eight or more rooms or in which ten or more persons are accommodated or lodge or reside above the second story, the owner, lessee or occupant of which is notified in writing by an inspector that the provisions of this act are deemed by him applicable thereto, shall be provided with proper egresses or other means of escape from fire, sufficient for the use of all persons accommodated, assembled, employed, lodged or resident therein; but no owner, lessee or occupant of such building shall be deemed to have violated this provision unless he has been notified in writing by such inspector what additional egresses or means of escape from fire are necessary and has neglected for thirty days, or has refused, to provide the same. The inspector may require that stairways shall be enclosed, that they shall have

suitable landings, that egress doors and windows shall have approved hardware, and that proper fire stops shall be provided in the floors, walls, partitions, and stairways of such building. He may make such further requirements as may be necessary to prevent the spread of fire, or its communication from any steam boiler or heating apparatus therein. The egresses and means of escape shall be kept unobstructed, in good repair and ready for use, and, if the inspector so directs in writing, every such egress shall be properly lighted and provided with a sign having on it the word "EXIT" in letters not less than five inches in height, and so made and placed as plainly to indicate to persons within the building the location of such egresses, stairways shall have suitable hand-rails, egress doors and windows shall open outwardly, and women or children shall not be employed, in a factory, workshop, mercantile or other establishment, in a room above the second story from which there is only one egress. Suitable incombustible receptacles shall be provided for ashes, rubbish or other refuse material. The certificate of the inspector shall be conclusive evidence of a compliance with the said requirements. Portable seats shall not be allowed in the aisles or passageways of such buildings during any service or entertainment held therein. Stairways on the outside of the buildings shall have suitable railed landings at each story above the first, accessible at each story from doors or windows, and such landings, doors and windows shall be kept clear of ice, snow and other obstructions.

SECTION 2. Said chapter six hundred and fifty-five of the acts of the year nineteen hundred and thirteen is hereby further amended by inserting after section twenty-two the following new section: — *Section 22A.* The basement of all schoolhouses now existing or hereafter built shall be protected as follows:

(1) Boilers, fuel, storage and work rooms shall, if so directed, be enclosed in masonry or fireproof walls, and all openings into the basement shall be provided with self-closing fireproof or automatic fire doors.

(2) All spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways shall be thoroughly fire-stopped in such manner as the inspector may direct.

(3) Stairways from the basement to the first story shall, wherever practicable, be enclosed with fireproof walls, and at the top or bottom of each stairway shall be installed a self-closing fireproof or automatic fire door, or a door covered with metal and containing wire-glass panels, or consisting of wire glass set in metal frames.

(4) Partitions of wooden sheathing, except water closet partitions, shall be covered with metal lath and cement plaster.

The foregoing requirements shall not apply to schoolhouses not exceeding one story in height, and containing not more than two rooms.



SECTION 3. Section twenty-one of said chapter six hundred and fifty-five is hereby further amended by adding at the end thereof the following: — Wherever conditions in case of schoolhouses involve exceptional fire hazard, the inspector may, with the approval of the chief of the district police, order the installation of an approved system of automatic sprinklers. Before approving such an order, the chief of the district police shall notify the owner of the building, and if requested, shall grant a hearing, — so as to read as follows: — *Section 21.* The basement and each story of a building which is subject to the provisions of the preceding section shall be supplied with means of extinguishing fire, consisting of a hose attached to a suitable water supply and capable of reaching any part of such basement or story, or of such portable apparatus as the inspector shall direct; and such appliances shall be kept at all times ready for use and in good condition. Wherever conditions in case of schoolhouses involve exceptional fire hazard, the inspector may, with the approval of the chief of the district police, order the installation of an approved system of automatic sprinklers. Before approving such an order, the chief of the district police shall notify the owner of the building, and if requested, shall grant a hearing.

SECTION 4. Section fifty-five of said chapter six hundred and fifty-five is hereby amended by inserting after the word "appeal", in the fourth line, the words: — to the chief of the district police, who may grant a modification of said order, requirement or direction. If said chief refuses to modify said order, requirement or direction, he shall notify the appellant in writing, who may, within ten days thereafter, appeal, — so as to read as follows: — *Section 55.* Whoever is aggrieved by the order, requirement, or direction of a building inspector of the building inspection department of the district police, may, within ten days after the service thereof, appeal to the chief of the district police, who may grant a modification of said order, requirement or direction. If said chief refuses to modify said order, requirement or direction, he shall notify the appellant in writing, who may, within ten days thereafter, appeal to a judge of the superior court for the county in which the building to which such order, requirement or direction relates is situated, for an order forbidding its enforcement; and after such notice as said court shall order to all parties interested, a hearing may be had before the court at such early and convenient time and place as shall be fixed by said order; or the court may appoint three disinterested persons, skilled in the subject-matter of the controversy, to examine the matter and hear the parties; and the decision of said court, or the decision, in writing and under oath, of a majority of said experts, filed in the office of the clerk of courts in said county within ten days after such hearing, may alter, annul or affirm such order, requirement or direction. Such decision or a certified copy thereof

shall have the same authority, force and effect as the original order, requirement or direction of the inspector. If such decision annuls or alters the order, requirement or direction of the inspector, the court shall also order the inspector not to enforce his order, requirement or direction, and in every case the certificate required by law shall thereupon be issued by said court or by said experts.

SECTION 5. The governor is hereby authorized to appoint to the force of the district police, in addition to the number heretofore authorized by law, and subject to the provisions of existing laws in respect to terms of office, salaries, powers and duties of said district police, five new members, who shall be employed as building inspectors of the building inspection department. Chapter four hundred and twenty-four of the acts of the year nineteen hundred and thirteen shall not apply to appointments made under this section.

SECTION 6. Section six of chapter seven hundred and nineteen of the acts of the year nineteen hundred and thirteen is hereby amended by inserting after the word "town", in the twenty-fourth line, the words: — (6) For making repairs and alterations in schoolhouses ordered by inspectors of the building inspection department of the district police under the provisions of chapter six hundred and fifty-five of the acts of the year nineteen hundred and thirteen, and acts in amendment thereof or in addition thereto, five years, — so as to read as follows: — *Section 6.* Cities and towns may incur debt, outside the limit of indebtedness prescribed in this act, for the following purposes and payable within the periods hereinafter specified: —

(1) For temporary loans under the provisions of sections three, four or nine, one year.

(2) For establishing or purchasing a system for supplying the inhabitants of a city or town with water, or for the purchase of land for the protection of a water system, or for acquiring water rights, thirty years.

(3) For the extension of water mains and for water departmental equipment, five years.

(4) For establishing, purchasing, extending or enlarging a gas or electric lighting plant within the limits of a city or town, twenty years; but the indebtedness so incurred shall be limited to an amount not exceeding in a town five per cent and in a city two and one half per cent of the last preceding assessed valuation of such town or city.

(5) For acquiring land for the purposes of a public playground, as specified in section nineteen of chapter twenty-eight of the Revised Laws and amendments thereof, thirty years; but the indebtedness so incurred shall be limited to an amount not exceeding one half of one per cent of the last preceding assessed valuation of the city or town.



(6) For making repairs and alterations in schoolhouses ordered by inspectors of the building inspection department of the district police under the provisions of chapter six hundred and fifty-five of the acts of the year nineteen hundred and thirteen, and acts in amendment thereof or in addition thereto, five years.

SECTION 7. This act shall take effect upon its passage.

MSH 20991

END OF
TITLE